

## RESIDENTIAL ELECTRICAL INSPECTIONS CHECKLISTS SWIMMING POOLS & HOT TUBS (2009 IRC)

### Key Questions for Residential Swimming Pool Inspections

1. Which sections of IRC Chapter 42 will apply to this installation?
2. What wiring methods will be used?
3. What electrical equipment will be associated with this installation and where will the equipment be located?
4. What type of underwater luminaires will be used?
5. What equipment will be required to be bonded and what will be used as the equipotential bonding grid?

### PERMANENTLY INSTALLED SWIMMING POOLS — SECTION 42, SECTION E4201 - E4206 CHECKLISTS

#### Permanently Installed Swimming Pools – Pre-Pour & Underground Inspection

✓	Item	IRC Reference	Inspection Activity
	1.	E4201.1, E4201.2	Review definitions and determine the applicability of Chapter 42.
	2.	E4203.6, Table E4203.5	Check for any overhead conductor over pool or within 3.0 m (10 ft) horizontally of pool for clearances from max. water level for conformance with overhead clearance requirements.
	3.	E4203.7, Table E4203.7	Check underground wiring for suitability, clearances from pool, and minimum cover requirements.
	4.	E4203.7	For underground wiring, where space limitations prevent wiring from being routed a distance 1.5 m (5 ft) or more from the pool, such wiring shall be permitted where installed in complete raceway systems.
	5.	E4206.4 thru E4206.7	Check underwater luminaire forming shells for locations, wiring methods, and connections to wiring methods.
	6.	E4205.5, E4206.5, E4205.3, E4205.4, E4205.6, E4206.13	Check pool-related equipment for appropriate wiring methods (pump motors, heaters, etc.).
	7.	E4206.9	Check junction boxes and enclosures connecting to underwater luminaires for listing and labeling, appropriate size and location, and proper materials.
	8.	E4206.10	Check forming shells and wiring methods for underwater audio equipment.
	9.	E4204.2, E4202.3	Verify that metal parts of pools and other nearby electrical equipment and all metal parts located within 1.5 m (5 ft) of the pool are bonded to an appropriate equipotential bonding grid, using appropriate methods.
	10.	E4204.2.1.2	If unencapsulated structural reinforcing steel is not used in the conductive pool shell for the equipotential bonding grid, insure that a copper grid system is installed for the equipotential bonding grid.
	11.	E4204.2.2	For the perimeter surface (deck), verify that the equipotential bonding grid extends at least 1 m (3 ft) horizontally under unpaved surfaces as well as poured concrete and other types of paving beyond the inside wall of the pool.
	12.	E4204.2.2.2	For the perimeter surface (deck), the equipotential bonding grid is required to be either unencapsulated structural reinforcing steel or an alternate means of an 8 AWG bare solid copper conductor.

## Permanently Installed Swimming Pools (cont.)

Permanently Installed Swimming Pools – Pre-Pour & Underground Inspection (cont.)			
✓	Item	IRC Reference	Inspection Activity
	13.	E4204.2.2.2	If an alternate means of an 8 AWG bare solid copper conductor is used as the equipotential bonding grid for the perimeter surface, this conductor should follow the contour of the perimeter surface, be located 450 to 600 mm (18 to 24 in.) from the inside walls of the pool, and be secured within or under the perimeter surface 100 mm to 150 mm (4 in. to 6 in.) below the subgrade.
	14.	E4204.2.2.2	If an alternate means of an 8 AWG bare solid copper conductor is used as the equipotential bonding grid for the perimeter surface, verify that only listed splices are used (if conductor is spliced).
	15.	E4204.2.2	Check that bonding to the perimeter surfaces is provided and attached to the conductive pool shell (reinforcing steel or copper conductor grid) at a minimum of four (4) points uniformly spaced around the perimeter of the pool.
	16.	E4204.2.6.1	Verify that where a double-insulated water pump will be employed, a solid 8 AWG copper conductor is installed that will extend from the equipotential bonding grid to an accessible point at the motor vicinity to make a bonding connection for a future replacement motor.

Permanently Installed Swimming Pool – Pre-Pour & Underground Inspection			
✓	Item	IRC Reference	Inspection Activity
	1.	E3403.1, E3403.3	Check pool equipment for suitability for use with swimming pools.
	2.	E4206.1	Check transformers for identification and suitability for the purpose. Transformers must be listed as a swimming pool and spa transformer.
	3.	E4206.3	Verify that conductors on the load side of GFCIs are separated from conductors not protected by GFCIs ( <i>with conditions</i> ):
	4.	E4203.6, Table E4203.5	Check for any overhead conductor over pool or within 3.0 m (10 ft) horizontally of pool for clearances from max. water level for conformance with overhead clearance requirements.
	5.	E4203.1.1, E4203.1.3	Verify that general-use receptacles are not located within 1.83 m (6 ft) of pool walls and that all receptacles within 6 m (20 ft) of pool walls are GFCI-protected.
	6.	E4203.1.1	Verify that any receptacle(s) between 1.83 m (6 ft) and 3.0 m (10 ft) of pool walls that are used for pool circulation equipment are single, grounding, locking types, and are GFCI-protected.
	7.	E4203.1.2	Verify that at least one GFCI-protected receptacle on a general-purpose branch circuit is installed between 1.83 m (6 ft) and 6 m (20 ft) of a permanently installed pool at dwelling units. This receptacle is to be located not more than 2.0 m (6 ft 6 in.) above grade. Measurements are to be made from the inside wall of the pool.
	8.	E4203.5	Check for other outlets (such as communication outlets), which are required to be located not less than 3.0 m (10 ft) from the inside walls of the pool.
	9.	E4203.4	Verify that luminaire / ceiling fan locations for required clearances above and around the pool areas are maintained [3.7 m (12 ft), 1.5 m (5 ft), etc.]
	10.	E4203.4.5	Verify that luminaires / ceiling fans are GFCI-protected where GFCI protection is required in adjacent areas.
	11.	E4203.2	Verify that switches (other than those listed for the purpose) are located at least 1.5 m (5 ft) from pool inside walls or separated from the pool by a permanent barrier.

## Permanently Installed Swimming Pools (cont.)

Permanently Installed Swimming Pool – Pre-Pour & Underground Inspection (cont.)			
✓	Item	IRC Reference	Inspection Activity
	12.	E4203.1.3	Verify that single-phase pool motors rated 15- or 20-A at 125-V or 240-V are GFCI-protected (direct-wired or cord- and plug-connected).
	13.	E4202.2	Check flexible cords (where used) for compliance with equipment grounding conductor requirements and 900 mm (3 ft) length limitations.
	14.	E4206.4 thru E4206.7 E4202.1, Table E4202.1	Check underwater luminaires for locations, wiring methods, and connections to wiring methods.
	15.	E4206.5.1	Verify that underwater luminaires can be removed from the water for inspection, relamping or normal maintenance and that they are installed so that relamping, maintenance, or inspection can be accomplished from the deck or equivalently dry location.
	16.	E4205.5, E4202.1, Table E4202.1,	Check pool-related motors for appropriate wiring methods. Any wiring method employed must contain an insulated copper equipment grounding conductor not smaller than 12 AWG.
	17.	E4206.9	Check junction boxes and enclosures connecting to underwater luminaires for listing and labeling, appropriate size, location, and proper materials.
	18.	E4206.9.1(5)	Check junction boxes connected to underwater luminaires for appropriate vertical [100 mm (4 in.) / 200 mm (8 in.)] and horizontal [1.2 m (4 ft)] spacing restrictions from pool.
	19.	E4206.10	Check forming shells and wiring methods for underwater audio equipment.
	20.	E4204.2	Verify that metal parts of pool, metal parts of the water circulating system, and other nearby equipment and all metal parts located within 1.5 m (5 ft) of the pool are bonded to the appropriate equipotential bonding grid, using appropriate methods.
	21.	E4204.3	Verify that the pool water is bonded to the equipotential bonding grid. An intentional bond of a minimum conductive surface area of 5806 mm <sup>2</sup> (9 in. <sup>2</sup> ) is required to be installed in contact with the pool water. This bond can be bonded parts that are already bonded (ladder, rail, underwater luminaire housing, etc.).
	22.	Section E4205	Verify that all equipment required to be grounded is grounded by insulated copper equipment grounding conductors of the proper size.
	23.	E4203.3	Verify that one or more disconnecting means is provided to simultaneously disconnect all ungrounded conductors, is readily accessible, located within sight of pool equipment, and not located within 1.5 m (5 ft) from the inside wall of the pool.
	24.	E4206.12	Check electric pool heaters for subdivision of heating elements and sizing of branch-circuit conductors.
	25.	NEC Default (680.11)	Check equipment rooms or pits for adequate drainage.
	26.	E4206.11	Check electrically operated pool covers for proper motor and controller location, motor enclosure, and GFCI protection.
	27.	E4206.13	Check deck-area heaters for suitability and proper clearances from pool.

## STORABLE SWIMMING POOLS — SECTION E4207 CHECKLISTS

Storable Swimming Pools			
✓	Item	IRC Reference	Inspection Activity
	1.	E4201.2	Review definitions and determine the applicability of Section E4207. [Maximum depth of 1.0 m (42 in.) for storable pool].
	2.	E4207.1	Verify that cord-connected pool pumps are double insulated and that internal metal parts are grounded through a grounding-type attachment plug.
	3.	<i>*UL Listing and Manufacturer's Specs.</i>	The 3-wire cord may be longer than 900 mm (3 ft). Listed filter pumps are usually equipped with cords * 7.5 m (25 ft) long.
	4.	E4207.1, E4207.2	Verify that all electrical equipment associated with a storable pool is provided with GFCI protection. Cord-connected pool pumps require GFCI protection that is an integral part of the attachment plug or located in the power supply cord within 300 mm (12 in.) of the attachment plug.
	5.	E4207.2	Verify that GFCI protection is provided for all 125-volt receptacles located within 6.0 m (20 ft) of a storable swimming pool.
	6.	E4207.4	Verify that no 125-volt receptacle is located less than 1.83 m (6 ft) of the inside wall of a storable pool.
	7.	E4207.3	Check luminaires for compliance with requirements based on the voltage of the luminaires.

## SPAS AND HOT TUBS — SECTION E4208 CHECKLISTS

Spas and Hot Tubs – All Installations			
✓	Item	IRC Reference	Inspection Activity
	1.	E4201.2	Review definitions and determine the applicability of Section E4208.
	2.	E3403.1, E3403.3	Check spa and hot tub equipment for suitability of use and approval.
	3.	E4201.1	Review the checklist for permanent pools for compliance with the applicable provisions of Sections E4201 through E4206 for outdoor spas or hot tubs ( <i>modified for indoor installations</i> ).
	4.	E4208.1	Check outlets supplying a self-contained spa or hot tub or a packaged spa or hot tub assembly for integral or separately provided GFCI protection.
	5.	E4203.3	Verify that one or more disconnecting means is provided to simultaneously disconnect all ungrounded conductors, is readily accessible, located within sight of pool equipment, and not located within 1.5 m (5 ft) from the inside wall of the pool.
	6.	E4208.2	Check electric pool heaters for listing, subdivision of heating elements, and sizing of branch-circuit conductors.

Spas and Hot Tubs – Outdoor Installations Only			
✓	Item	IRC Reference	Inspection Activity
	1.	E4201.1	Verify that the outdoor spa or hot tub installation complies with the provisions of Sections E4201 thru E4206.
	2.	E4202.1, Table E4202.1, Footnote f	Where liquidtight flexible metal conduit or liquidtight flexible nonmetallic conduit are used with listed packaged spa or hot tub equipment assemblies or self-contained spas or hot tubs, the flexible conduit shall not be permitted in lengths of more than 1.8 m (6 ft).

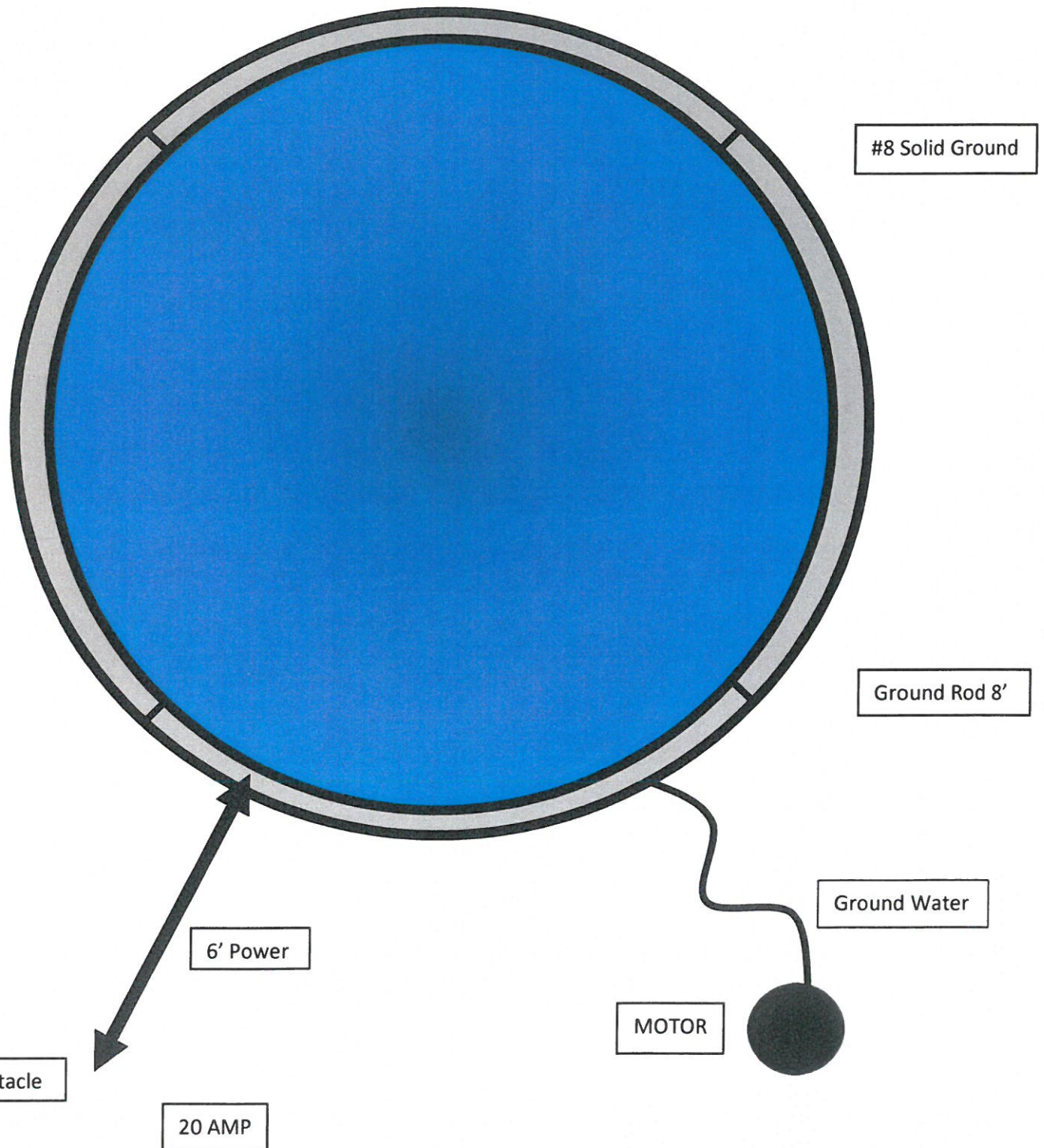


## Spas and Hot Tubs (cont.)

Spas and Hot Tubs – Outdoor Installations Only (cont.)			
✓	Item	IRC Reference	Inspection Activity
	3.	E4202.2(3)	Verify that cord- and plug-connections used with listed packaged spa or hot tub equipment assemblies or self-contained spas or hot tubs do not exceed 4.6 m (15 ft) in length and are GFCI-protected.
	4.	E4202.1, Table E4202.1, Footnote b	Verify wiring methods to motor, heating, and control loads that are part of a self-contained spa or hot tub, or a packaged spa, or hot tub equipment assembly. (Type NM cable are permitted for interior wiring to outdoor installations.)

Spas and Hot Tubs – Indoor Installations Only			
✓	Item	IRC Reference	Inspection Activity
	1.	E4202.1, Table E4202.1	Verify that a suitable wiring method is used to supply and connect spas and hot tubs, unless cord- and plug-connections are permitted.
	2.	E4203.1.4	Verify that at least one GFCI-protected receptacle on a general-purpose branch circuit is located between 1.83 m (6 ft) and 3.0 m (10 ft) of the inside walls of the spa or hot tub.
	3.	E4203.1.5	Check that no receptacles are located within 1.83 m (6 ft) from the inside walls of an indoor spa or hot tub and that any receptacles (125 volts and 30 amperes or less) that are located within 3.0 m (10 ft) of the inside walls of an indoor spa or hot tub are GFCI-protected.
	4.	E4208.1	Verify that any receptacles used to supply power to an indoor spa or hot tub is GFCI-protected.
	5.	E4203.4.4	Verify that luminaires and ceiling fans are spaced as required from spa or hot tub walls and above maximum water level and that GFCI protection is provided, as required.
	6.	E4203.2	Verify that wall switches are located at least 1.5 m (5 ft) from the inside walls of the spa or hot tub.
	7.	E4204.5	Verify that all parts that are required to be bonded are bonded using appropriate methods.
	8.	E4205.1(2) and (3)	Verify that all parts that are required to be grounded are grounded using appropriate methods.
	9.	E4206.10	Check underwater audio equipment for compliance with E4206.10

# POOL RULES



## **Required Inspections**

### **In ground pool**

Footings  
Electric bonding  
Electric  
1<sup>st</sup> Plumbing- Pressure test (25# for 30 mins)  
                    before pipes are covered  
2<sup>nd</sup> Plumbing- Pressure test on pipes during pour  
                    With inspector present  
Gas  
Final

### **Above ground pool**

Electric  
Electric Bonding  
Gas if needed  
Final